SOME OBSERVATIONS ON AL-FARABI AND LOGICAL TRADITION

by

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Towards the end of the first part of his commentary on Aristotle's *De Interpretatione*, al-Farabi says:[1]

> At this point, we must enumerate the types ⟨sc. of pairs of opposite statements⟩ the way we ourselves have been [or: have] taught to enumerate them.

64, 3 (§1) We say that there are two types of opposite [*al-mutaqābilān*] affirmations and negations: the type in which the subject [*al-mawḍūʿ*] of every pair of opposites has universal [*kullī*] reference and the type in which the subject of every pair of opposites has individual [*shakhṣī*] reference. Of the type in which the subject of every pair of opposites has universal reference, one kind is indeterminate [*muhmal*], ⟨i.e.⟩ not accompanied by a quantifier [*sūr*] (not even in just one of the opposites), the other kind *is* accompanied by a quantifier. Those in which a quantifier is linked with the subject divide into those in which a universal quantifier is linked with the subject of both opposites, those in which a particular [*juzʾī*] quantifier is linked with the subject of both opposites, those in which a universal quantifier is linked with the subject of the affirmation [*al-mūjib*] and a particular quantifier with the subject of the negation [*as-sālib*] of a pair of opposites, and finally those in which a particular quantifier is linked with the subject of the affirmation, and a universal quantifier with the subject of the negation.

64, 10 (§2) This account yields six types. When these are reiterated in each of the three ⟨modes of⟩ matters [*al-mawādd ath-thalāth*]—the necessary [*aḍ-ḍarūrī*], the impossible [*al-mumtaniʿ*] and the possible [*al-mumkin*] —the result is 18 types. And when these are multiplied

by the three tenses, the result is 54 types. In each of these 54 types the subject is either a definite [*muḥaṣṣal*] or an indefinite [*ghayr muḥaṣṣal*] noun, which makes it 108 types. And in each of these the subject is either a straight [*mustaqīm*] or a bent [*mā'il*] (i.e. inflected) noun, which makes it 216 types. Now the bent noun can be divided into its types, four according to the account of the Greek grammarians, so that the 108 bent types multiply and become 432 types. When they are added to the 108 straight types the number of types is 540. And since all these types are pairs of opposites each pair of opposites consisting of an affirmation and a negation, the result for the types of binary statements [*al-qaḍāyā ath-thunā'iyya*] will be twice this number. That is to say, there are 1080 statements.

64, 21 (§3) Since indefinite verbs [*al-kalim*], on account of their signification, do not signify anything but negation, there are no deflected [*ma'dūl*] statements among the binary statements. If there were they would double. But as the force of indefinite verbs is that of negation, by the evidence of usage in all languages, there are no deflected statements in the class of binary statements due to the signification of the words expressing them. Hence this is the final number of opposite binary statements.

64, 25 (§4) This is why Aristotle considers first of all these six types and gives each of them a name to distinguish it from the others. Opposites whose subject is an individual he calls "individual" opposites, and those whose subject is a universal without any quantifier "indeterminate". (Aristotle does not explicitly use this term here but does in the *Prior Analytics*, and the commentators take it from there to use it here as well.) Those in which the subject of both affirmation and negation is linked with a universal quantifier ("every" in the case of the affirmation and "no one" in the case of the negation) he calls "contraries" [*mutaḍāddān*], and those in which the subject of both of them is linked with a particular quantifier he calls "opposite to the contraries" (the commentators call them "subcontraries" [*mā taḥta 'l-mutaḍāddayn*]). And those in which a universal quantifier is connected with the subject of either part of an opposition and a particular quantifier with the subject of the other he calls "contradictories" [*mutanāqiḍān*], whether the universal quantifier goes with the affirmation or with the negation.

This is an amazing collection of oddities and obscurities, which can only be understood as an outcome of the peculiar process by which logical

knowledge was transmitted from the Greek to the Arab world until it finally reached al-Farabi. The way the quoted passage reflects this process makes it worth discussing, however questionable its philosophical value. It abounds with striking features which can serve as leading fossils for the isolation of its historical layers. For this reason, it lends itself admirably to paradigmatic and comparative analysis. I shall first discuss al-Farabi's proposition count in its details and then compare his presentation of the topic with older parallels in Greek, Syriac and Arabic, both from the angle of argument and of terminology.[2]

I

There is to begin with the question whether we should read *urshidnā* or *arshadnā* (passive or active) in the first sentence. The active reading would indicate that al-Farabi is repeating a piece of doctrine developed or adopted by him in his own teaching; the passive reading would make him announce that he is recapitulating something he had been taught by someone else. In this case, we would have to ask whether he is referring to the Syrian Christian philosophers of Baghdad who were his direct teachers,[3] or more generally to any authorities from whose works he may have derived instruction, such as "the commentators" he mentions so frequently. In fact, there are reasons to support the passive reading. It is true that for the active reading parallels are to be found within the commentary, where al-Farabi refers to previous teachings or writings of his own,[4] but certain points of our passage are not quite consistent with his opinion as expressed elsewhere in the commentary and in his parallel treatise on the subject matter of *De Interpretatione*.[5] An argument from inconsistency may not be conclusive, yet it is supported by the fact that there is no parallel count of proposition types in the *K. al-'ibāra*, which we would expect if this count were part of al-Farabi's own stock teaching.

However inconsistent our passage may be, in certain points, with what al-Farabi says elsewhere, it is consistent in itself—at least its arithmetic is right. That is to say, we have to accept that the text was written down first exactly as it is now, much as we might wish to consider it as corrupt in places.

§1. This is the scheme according to which the six basic types of oppositions are derived (an "opposition" holding between two simple statements identical save for the negative particle[6]):
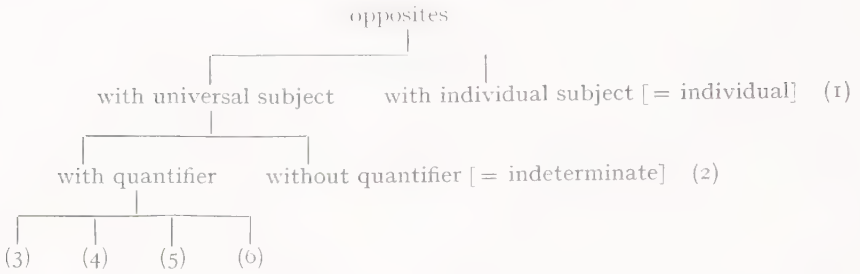
(3) universal quantifier + affirmation *vs.* universal quantifier + negation
i.e.

$$\text{For all X}::\begin{bmatrix} \text{X is P} \\ \text{not: X is P } [= \text{no X is P}] \end{bmatrix} \quad \text{contraries}$$

(4) particular quantifier + affirmation *vs.* particular quantifier + negation
i.e.

$$\text{For some X}::\begin{bmatrix} \text{X is P} \\ \text{not: X is P} \end{bmatrix} \quad \text{subcontraries}$$

(5) universal quantifier + affirmation *vs.* particular quantifier + negation
i.e.

$$\left.\begin{array}{l} \text{For all X: X is P} \\ \text{For some X:: not: X is P} \end{array}\right] \quad \text{contradictories}$$

(6) particular quantifier + affirmation *vs.* universal quantifier + negation
i.e.

$$\left.\begin{array}{l} \text{For some X: X is P} \\ \text{For all X:: not: X is P} \end{array}\right] \quad \text{contradictories}$$

By now it has become plain that a "quantifier" is an expression defining the range of application of a universal term, a term, that is, which is applicable to a plurality of objects. Modern formal logic operates with just two quantifiers, "all" and "some"; so does, as we see, our account.[7]

§2. The first and last paragraphs can be considered as based on Aristotle's text and as drawing out Aristotelian lines. Not so the middle paragraphs. "The three ⟨modes of⟩ matters" do not derive directly from Aristotle— neither the concept of matter-of-fact modality nor the list of these particular modalities.[8] We learn from Ammonius (88,17 ff.) and Stephanus (25,22 ff.) that these three modalities, which they call σχέσεις, were in old times known as ὗλαι.[9] The point of this nomenclature appears to be that a modality attaches to a statement in virtue of the state of affairs—the "matter"—which it describes, even though the modality may not be expressed within the statement through modifying expressions like "it is possible/necessary/impossible thàt . . .". Such expressions are called τρόποι [zənāthā (Syr.)—jihāt (Ar.)—*modi*]. They form a major theme of *De Int.*

(from 21ª34). We would not be surprised to find them listed among the elements of proposition patterns, while it is hard to see a justification for the occurrence of material modalities in this proposition count. It can hardly be reconciled with al-Farabi's insistence, from the very first sentence of his commentary, that this book of logic is concerned with the formal structure [*ta'līf*] not the matter [*mādda*] of simple statements. The only reason for the occurrence of the three material modes in this place is that they had occurred in the same place for some centuries. For the same reason it was possible for a non-Aristotelian list of modalities to be kept. The place in Aristotle which springs to the mind is *An. Pr.* 25ª1 f.:

> Πᾶσα πρότασίς ἐστιν ἢ τοῦ ὑπάρχειν ἢ τοῦ ἐξ ἀνάγκης
> ὑπάρχειν ἢ τοῦ ενδέχεσθαι ὑπάρχειν.

This is, in fact, the triad of modalities adopted by al-Farabi in *K. al-'ibāra* for his discussion of modality there.[10] It appears, then, that "the three modes of matters" listed here are fairly unrelated to al-Farabi's own theoretical concerns.

"The three tenses [ἀ τρεῖς χρόνοι (Stephanus 34,16)] have a basis in *De Int.* So have the "definite" and "indefinite"[11] nouns and verbs and their role in generating special types of propositions.[12] What is known as "indefinite" words in *De Int.* is οὐ-composites like οὐκ ἄνκρωπος and οὐχ ὑγιαίνει. The equivalent *lā*-composites of the Arabic translation are even more awkward than their Greek originals, for in Greek one can at least think of the *alpha privativum* whereas Arabic does not allow for composites of any kind at all. Hence it seems rather pointless for a logician whose language is Arabic to bother much with such artificialities. Al-Farabi is not normally interested in indefinite nouns figuring as subjects as envisaged in the second paragraph. They are not mentioned at all in the commentary itself.[13]

The talk of a "straight" and "bent"[14] noun is incomprehensible in an Arabic context, hence a proper term of Arabic grammar had to be added for an explanation. This distinction is not drawn from either the Greek of Aristotle or its Arabic translation. It goes back to well-known Greek discussions, though not necessarily to Greek grammar proper as the reference to "the Greek grammarians" will make us believe. It cannot be ruled out that Greek grammatical texts were known to the fathers of this account, but it is more natural to assume that it was drawn from the philosophical commentaries, in which plenty of information on points of grammar was to be found. This is how Stephanus (10, 22 ff.–ad 16ª33) sums up the traditional discussion concerning the cases of the noun:

At this place, commentators usually examine what is known to

grammarians as cases as to whether their number is four or five.
The Stoics and nearly all who apply themselves to the art of grammar
hold that there are five cases, that is to say, they refer to the so-called
εὐθεῖα as a case as well.

In this dispute, the opponents of the Stoics and grammarians are the
Peripatetics, who adhere to Aristotle's distinction between (uninflected)
noun and nominal cases in *De Int.* 16ᵃ33, thus not counting the nominative
as a case. Although the late Greek commentators side with the Peri-
patetics[15] on this point, they freely use the Stoic terms.[16] It is, therefore,
unnecessary to assume a special Stoic influence for the corresponding
Arabic terms. More significant is the occurrence in our text of the number
"four", in which the Peripatetic doctrine on the number of cases can be
seen to be reflected. It will appear, then, that the information that there
are four *casus obliqui* has been ascribed to "the Greek grammarians" just
because it concerns a point of grammar. It is probable that by the time
our account was formulated the origins of the assumptions on which it is
based were no longer exactly known.

Seeing that the enumeration is meant to be of "binary" statements it
is hard to understand how the nominal cases could be drawn into it. The
distinction between "binary" and "ternary" statements is part of al-
Farabi's regular terminology. It is based on *De Int.* 19ᵇ20, where the
copula is introduced as a *third* component. Hence a statement composed
of a subject noun, the copula and a predicate noun is here called "ternary",
and a statement composed of a noun and a verb is called "binary". In
such a binary statement we do not expect—neither in Greek nor in Arabic—
the noun to be in any case other than the nominative. Aristotle himself
seems to point out (*De Int.* 16ᵇ1 ff.) that inflected nouns together with a
verb do not make a proposition, in saying that, e.g., "Philo's is" is not
capable of being regarded as either true or false. Now we learn from the
Greek commentaries[17] that the Stoics observed that this is true for the
verb "to be" and many others but that there are cases—e.g. Σωκράτει
μεταμέλει—where we have a (binary) statement whose noun is in the
dative case. This may be at the bottom of the tradition which culminated
in our Arabic account. However, similar considerations could not have
applied to all four oblique cases. The vocative for one would have had to
be excluded, since—according to Peripatetic as well as Stoic doctrine—any
binary sentence with a vocative as one of its elements would count as an
exclamation in the technical sense in which it is one of the kinds of
sentences that are no statements (λόγος κλητικός and προσαγορευτικός resp.
as opposed to λόγος ἀποφαντικός and ἀξίωμα resp.). The Peripatetic

version of this doctrine was known both in the Baghdad school and to al-Farabi.[18] The author of our account when talking about the four oblique cases was either guilty of gross negligence or, more likely, did not really know what he was talking about.

§3. "Deflected" statements are those whose predicate is indefinite, i.e. a *lā*-composite.[19] We find them treated elaborately in both the commentary and the *K. al-ʿibāra*. If we want to find the rationale behind the assertion that an indefinite verb does not cause a statement to be deflected but just renders it negative we have to think of the Greek model supplied by Aristotle in *De Int.* 19ᵇ21 ff.: ἔστι δίκαιος ἄνθρωπος. The negative particle οὐ when placed before ἔστι is supposed to turn the affirmation into a negation while rendering δίκαιος or ἄνθρωπος indefinite when placed before either of them, the statement itself remaining affirmative. Obviously, if ἔστι δίκαιος is replaced with a single verb the number of possible positions for the negative particle will be reduced by one. Consequently, the negation of the statement and that of the predicate will coincide in form.[20]

We often find references to "all" or "the other" languages in al-Farabi's logical writings, but the present passage alone would be sufficient to teach us not to read too much into them. Languages referred to by name are mainly Greek and, less often, Persian and Syriac. Demonstrably, al-Farabi knew no Greek, and there is no reason to assume that his knowledge of either Syriac or Persian was considerable. Apparently the attested example of Greek was weighty enough to give a logico-grammatical observation the rank of a universal rule. The unconditional acceptance of the five cases (Arabic has a maximum of three) is a striking example. Such a thing could, of course, only happen in a state of affairs in which people were no longer able to examine critically the information they received about the original language of the theories they learnt. That such—correct or incorrect—rules of Greek grammar as became known to speakers of Syriac and Arabic should have acquired the status of rules of universal grammar after knowledge of Greek had become scanty or extinct is not altogether incomprehensible as they came to them within the context of the theory of logic, which was believed to formulate canons of thought universally valid.

§4. In the last paragraph we observe an effort to tie up what has been received through tradition with Aristotle's own texts. This effort could be al-Farabi's own contribution (the whole account can hardly be considered his own any more), since it is based on texts available to him in Arabic: we do find the same word for "indeterminate" in the Arabic

translation of *An. Pr.*, and the information that the subcontraries[21] of the commentators are known to Aristotle as "what is opposite to the contraries" is extracted from *De Int.* 17ᵇ24.[22]

By implication the whole account is attributed to "the commentators", who constitute one of the most intricate problems of al-Farabi's own commentary. He frequently refers to "(some of/all of) the commentators", but whom exactly he has in mind can seldom be established. It is not unlikely that often he would have been unable himself to specify by name the authors concerned. It is quite evident that his commentary is related to the tradition of the Greek commentators, but those of his references that can be checked are often imprecise or incomplete, some are obscure, some incomprehensible, whereas the extant Greek commentaries of Ammonius and Stephanus are generally lucid to the point of triviality. It appears that al-Farabi, if at all, did not know them in full nor in direct translation. That he knew greater parts of any other of the great Greek commentaries now lost can probably be ruled out too. Yet the way he refers to "the commentators" as saying this or that *ad locum* clearly suggests that he studied Aristotle's text together with accompanying comments. Maybe they were of the type, if more detailed and abundant, we find on the margins of the Paris manuscript of the *Organon* in Arabic which was produced among the Syrian Christian philosophers of Baghdad three generations after al-Farabi.[23] In fact, some of the notes attached to the text of *De Int.* bear close resemblance to passages in al-Farabi's commentary. It is mainly Abū Bishr Mattā, one of al-Farabi's most likely sources, from whom paraphrases of the views of "the commentators" are transmitted. An examination would probably bring out that he too did not draw his knowledge directly from original texts.[24] His resources were restricted to Syrian traditions anyway, if it is true that he knew no Greek.[25] If al-Farabi is indeed attributing the passage under discussion to "the commentators", then he must be including among them transmitters and innovators who did not know much Greek. Abū Bishr Mattā, for example, would then qualify to be considered as one of them.

So far, we have seen that al-Farabi's passage is made up of Greek material. The lack of understanding with which the nominal cases are drawn into it shows that non-Greek transmitters must have had a hand in its final make-up. But it seems unlikely that it could have been al-Farabi himself who compiled it, as it fits in badly with his theory of propositions. Thus we can take the first sentence (in the passive reading) literally and regard the passage as recapitulating something which al-Farabi had been taught by one of his Syrian teachers.

II

We have Greek, Syriac and early Arabic proposition counts to compare with al-Farabi's. Apart from showing that the proposition count was a stock topic of the ancient tradition of commentaries on *De Int.*, a comparison will reveal something about the course of its transmission from the Greek to the Arab world.

Probha's, Ammonius' and Stephanus' patterns of procedure are next to identical. At the beginning of the second sections[26] of the commentaries (from ch. 7 of *De Int.* according to the modern division) we find announcements of the following kind:

> *Probha* (Hoffmann's trl. p. 110): Quaerimus autem ante hanc sectionem tria quaedam quae prosunt nobis in ea: qui sunt numeri protasium qui possint esse in ea et aliquid de prosidiorismo [the Greek word for quantifier] et quomodo fiat quidem affirmatio negatio.

> *Stephanus* (24,11 ff.): After that, Aristotle deviates from the topic of oppositions and is now discussing propositions composed of subject and predicate only, like "a man walks", "Socrates walks". But before the *verbatim* exegesis we shall inquire about these three headings: firstly what a quantifier is (this concerns the other kinds of propositions as well) and how many quantifiers there are; secondly, what the number is of propositions composed of subject and predicate only; and thirdly, how we turn affirmations into negations.

Sections 3 and 4 start similarly.[27] In the Greek division of the text of *De Int.* the second part is dedicated to opposite pairs of propositions composed of subject and predicate only ("binary" propositions in the convenient Arabic terminology), the third part (from 19^{b}19) to opposite ternary propositions, and the fourth part (from ch. 12) to opposite modified (binary or ternary) propositions. Comments on these three parts begin with excurses on the components, numbers and positive-negative conversions of the respective pairs of opposites. This scheme of commentation could be very old, as it is based on the very principle of the division of the Aristotelian text. Al-Farabi seems to have been aware of it to a certain extent, but he has not adopted it.[28]
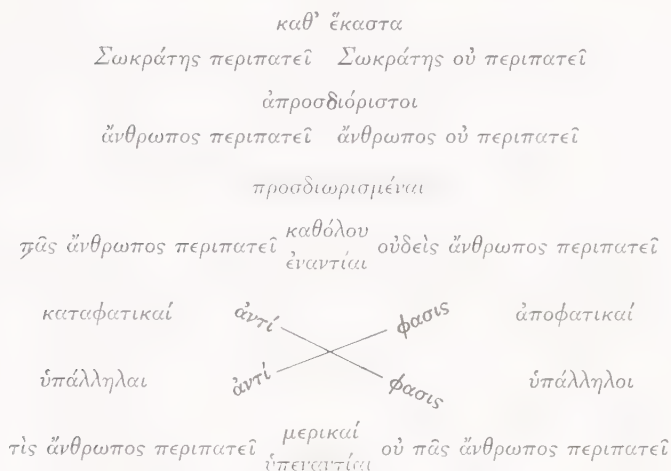
In the proposition count, Probha, Ammonius and Stephanus unanimously begin with the distinction between propositions about individuals and about universals, dividing the latter into unquantified and quantified, and the quantified into universal and particular propositions. These four groups they lead through the three tenses and the three material

modalities, ending up with 36 pairs of opposites, i.e. 72 propositions.
Since one of the two terms of a binary, and two of the three terms of a
ternary proposition may be either definite or indefinite, the result is 144
for binary and 288 for ternary propositions. These and their modified
forms (the combination with three modifiers yielding six new types of
affirmations and negations) add up to a final result of 3024.[29]

The oldest surviving proposition count is that of Syrianus (first half
5th century) as related by Boethius. In it the singular, unquantified,
particular and universal forms of the two binary and the four ternary
pairs of opposites are summed up (24 pairs, 48 propositions) and multiplied
by 3 for the three *qualitates* (necessaria, contingens, inesse [ὑπάρχειν]). The
resulting 144, says Boethius, are all the propositions treated in *De Int.*
Since any dependence of Probha on Ammonius has been ruled out,[30] both
of them must have had a common model for their proposition counts. It
is possible that Boethius does not reproduce Syrianus' account completely
and that it was Syrianus who actually provided this common model. It is
also possible that Probha and Ammonius drew their proposition counts
from another source and that Boethius' report is correct (it is certainly
nearer to a hypothetical prototype than that of Probha and Am-
monius[31]).

However this may be, it is Probha's and Ammonius' common model
to which al-Farabi's version of the proposition count too goes back
ultimately. Whether any one of the commentaries of Probha, Ammonius
or Stephanus was a link in the chain of transmission, or none of them, can-
not be decided,[32] but it can be ruled out that al-Farabi's version was
derived directly from any one of them (or their model). It is removed from
their version by at least two steps of further development (or rather
degeneration). One of them is the inclusion of nominal cases. The other,
and probably earlier one is the inclusion of distinctions deriving from the
square of oppositions. Indeed, al-Farabi's proposition count presents a
blend of two neighbouring but heterogeneous topics, and not altogether a
successful blend at that.

The enumeration of affirmations and negations in the Greek com-
mentaries is preparatory to the discussion of the theme of *De Int.* 7 ff., the
relationships between opposites with respect to truth and falsehood.
Now quantified affirmations have two different opposites according as
the quantifier or the predicate is negated. Therefore, a special discussion
of the different kinds of oppositions is called for. As far as quantified
propositions go, these are traditionally illustrated by the square of opposi-
tions, which is also part of a diagram attached by Ammonius to his discus-
sion of kinds of oppositions (93,10 ff.):

καθ' ἕκαστα

Σωκράτης περιπατεῖ   Σωκράτης οὐ περιπατεῖ

ἀπροσδιόριστοι

ἄνθρωπος περιπατεῖ   ἄνθρωπος οὐ περιπατεῖ

προσδιωρισμέναι

$$\underset{\overset{\kappa\alpha\theta\acute{o}\lambda\text{ου}}{\grave{\epsilon}\nu\alpha\nu\tau\acute{\iota}\alpha\iota}}{\pi\hat{\alpha}\varsigma\ \check{\alpha}\nu\theta\rho\omega\pi\text{ος}\ \pi\epsilon\rho\iota\pi\alpha\tau\epsilon\hat{\iota}}\qquad\text{οὐδεὶς ἄνθρωπος περιπατεῖ}$$

καταφατικαί   ἀντί   φασις   ἀποφατικαί

ὑπάλληλαι   ἀντί   φασις   ὑπάλληλοι

$$\text{τὶς ἄνθρωπος περιπατεῖ}\ \underset{\overset{}{\vec{\upsilon}\pi\epsilon\nu\alpha\nu\tau\acute{\iota}\alpha\iota}}{\overset{\mu\epsilon\rho\iota\kappa\alpha\acute{\iota}}{}}\ \text{οὐ πᾶς ἄνθρωπος περιπατεῖ}$$

We note that §1 of al-Farabi's passage corresponds exactly with this diagram (omitting the subalterns [ὑπάλληλοι], which are after all no opposites in the sense of *De Int.*, and are only mentioned at random by Ammonius, for the sake of completeness). It is easy to see that the six oppositions enumerated result from six different ways of pairing eight propositions but not from pairing twelve different propositions. It is, therefore, a mistake when at the end of §2, according to the original pattern of the proposition count, twice the number of opposite pairs is taken for the number of different propositions of which they consist. The final number of propositions ought to be 720 rather than 1080.

Paulus Persa's treatise offers a remarkable parallel. He states (p. 13 of Land's translation) that there are eight kinds of oppositions: contraries, subcontraries, two kinds of subalterns, two kinds of contradictories, indeterminates and opposites with proper names. He proceeds to mention the three material modes (p. 14), the three tenses (p. 15), the copula, indefinite nouns and verbs, and modifiers (p. 16), with the repeated remark that such factors make for special kinds of oppositions whose number he does not bother to work out. He finishes the topic as follows (p. 17):

> Quoniam ergo oppositiones universales et particulares una cum indefinitis et nomina significantibus octo sunt, propositiones vero earum sedecim.

Here we find the same blunder as in al-Farabi's passage, since again Paulus Persa's pairs of opposites derive from just eight, not sixteen, different affirmations and negations.

This blunder and the combination of opposition and proposition count are features striking enough to suggest a common source for al-Farabi's authorities and Paulus Persa.[33] In any case, this parallel shows that al-Farabi's passage is much more likely to go back to some manual of logic summarizing one or several of the great commentaries than to any such commentary directly. Such summaries were made in Syriac apparently even before Greek philosophical learning had come to a halt with the generations of Ammonius and his pupils. The syllabus of Christian teaching included logic, but really only on an elementary level. To satisfy existing needs one did not turn to the ancient works or the compendious and immensely learned volumes of later exegesis. It is to be expected that numerous teaching manuals and summaries were drawn up, works which did not assume a value of their own and are now mostly lost. It is in this form (i.e. in a very condensed form and in separation from Aristotle's books proper) that the Muslims are likely to have come to know logic first when, some time after their conquest of areas of Greek learning, they began to take an interest in it. It is plausible that teachings available then should in certain points have grown distant from their ancient fundaments and that some of their elements should no longer have been understood completely. Al-Farabi's passage is best envisaged as an outcome of a Syrian teaching tradition based on Syriac summaries of late Greek works. It was no longer intelligible how it derived from Aristotle's text. Hence it occurs in al-Farabi's commentary as a stray unit rather than an integral part.

Of the available Arabic documents previous to that of al-Farabi only ibn al-Muqaffa''s work is detailed enough to allow a comparison on the level of doctrine. Its section on *De Int.* can to its greater part be characterized as just a protracted proposition count. The count begins (pp. 76–77) with a list of the eight kinds of oppositions we know from Paulus Persa, in the same order of succession (the six quantified types, universal, particular, positively subaltern, negatively subaltern and two kinds of contradictory, plus indeterminate and individual oppositions). Later (88–89), the same number (not the double!) is correctly given for the total of statements involved, i.e. affirmations and negations together. Taking indefinite nouns into account, his number of statements composed of a subject and one predicate is 16. Later (141 ff.), he discusses statements with two and three predicates, giving their numbers as 32 and 64 respectively. Finally he sums up (141 ff.), taking the 112 types hitherto counted through the three tenses, the three material modes (necessary, possible, impossible) and the three corresponding forms of modification. His overall result, then, is 3024.

The mistaken representation of binary, ternary and modified proposi-

tions as ones with one, two and three predicates may be due to a mis-apprehension on the part of ibn al-Muqaffaʿ himself. Otherwise this proposition count is of the Probha-Ammonius type with all, and only, its factors and with the same final result. Assuming that ibn al-Muqaffaʿ's book really is a translation[34] nothing can be concluded about the date of the work translated. All that can positively be stated is that ibn al-Muqaffaʿ and al-Farabi's source share a Greek ancestor and that ibn al-Muqaffaʿ is not al-Farabi's source.

Ibn al-Muqaffaʿ's work may well have been used by al-Kindi and the Ikhwān aṣ-Ṣafāʾ (though not exclusively).[35] On the whole, we gain the impression that logical theory reached the Muslims through various channels, in a condensed and distorted form, and in separation from Aristotle's works proper. That is to say that bits of degenerated Aristotelianism arrived and were absorbed earlier than Aristotle's own works. Al-Farabi's passage in particular seems to bear witness to an unbroken Syrian tradition of logical teaching.

III

Although the four early Arabic documents here taken into account are too different to be taken as manifestations of a single line of trans-mission, they share a certain amount of technical vocabulary. Some of the shared terms are so peculiar that they must have come from a single source to all who used them. The table below puts together the (slightly extended) set of technical terms offered by al-Farabi's passage (all of them used by him regularly) with their Greek, Syriac and early Arabic equiva-lents. It is impossible to evaluate the whole table here. The differences will have to speak for themselves. It is only the terms shared by all Arabic authors that will be given further attention.

The shared terms (*mutanāqiḍ, mawḍūʿ, maḥmūl, muhmal, sūr, mūjib, sālib, mumtaniʿ, qaḍiyya*) bear witness to the existence among the Muslims of a technical language of logic from at least as early a time as ibn al-Muqaffaʿ's. The question is whether ibn al-Muqaffaʿ himself created an Arabic terminology part of which was afterwards accepted generally, or whether the terms in question were already in use among earlier or contemporary logicians forming part of the chain of transmission with which al-Farabi is linked.

There is some evidence in favour of the latter possibility. For we find the following interesting statement in ibn al-Muqaffaʿ's work (p. 92):

Wa-dhālika anna li-kulli kalāmin ḥaddayni aḥaduhumā ʾl-ismu wa-l-ākharu ʾl-ḥarfu ʾlladhi yuḥmalu ʿalā ʾl-ismi ka-qawli ʾl-qāʾili Fulānun

Aristotle	Greek commentators	Probha	Paulus Persa	Arab. trls. of Aristotle[36]
ἀντικείμενα ἀντίθεσις	ἀντικείμενα, ἀντίθεσις		dalqubhlāyāthā	forms of: (ta)qābala, 'ānada, 'ādala, khālafa, dādda, nāqada
ἐναντίαι	ἐναντίαι		saqubhlāyāthā	forms of: didd, (ta)dādda
	ὑπεναντίαι		təheth saqubhlā	
ἀντίφασις	ἀντίφασις		luqbhal mi'mrē, antiphāsis	naqida, tanāqud, munāqada
	ὑπάλληλοι		təheth hədhādhē	
καθόλου	καθόλου	kulnāyā	kulnāyā	kullī, al-kull, 'āmm(ī)
κατὰ μέρος, ἐπὶ μέρους, ἐγμέρέι	μερικός	mənāthāyā	mənāthāyā	juz'ī, al-juz'
ἄτομον	ἄτομον	atōmā		shakhs, alladhī lā yatajazzā'
καθ' ἕκαστον	καθ᾽ ἕκαστον, μερικός	mənāthāyā		juz'ı, mufrad, wahīd
ὑποκείμενον	ὑποκείμενον	haw də-sim	mettəsimānithā	mawdū'
κατηγορούμενον	κατηγορούμενον	haw də-methqatreg	methqatrəgānithā	mahmūl, maqūl, na't, sifa
ῥῆμα	ῥῆμα	melləthā	melləthā	kalima
ὄνομα	ἡ εὐθεῖα/ὀρθή			ism
πτώσεις	αἱ πλάγιαι	ptosis, mappalāthā		tasārif
ἀόριστος	ὡρισμένος — ἀόριστος	(lā) məthahmā	lā məthahmā	(ghayr) mahdūd, muhassal
ἀδιόριστος	ἀπροσδιόριστος	lā məthahmā	lā mettəsigānūthā	ghayr mahdūd (muhmal)
	προσδιορισμός	prusdīrismus	(prusdīrismus)	
κατάφασις	κατάφασις	qat(aphasis)	qātāphāsīs	mūjib, ijāb, ithbāt
ἀπόφασις	ἀπόφασις	aphuphasis	aphūphāsīs	sālib, salb, nafy
	ἐκ μεταθέσει			
	ὕλαι, σχέσεις	hūlā	təlāth hūlas	
	ἀναγκαῖος	āləsāyā	ananqāyā	
	ἀδύνατος	lā meshkəhānāyā	lā meshkəhānāyā	
	ἐνδεχόμενος	methmasyānā	methmasyānā	
ἀπόφανσις	πρότασις, ἀπόφανσις (ἀξίωμα) (λόγος ἀποφαντικός, ἀξίωμα)	prutasis, aphaphansis (mi'mrā pāsōqā)	prutasis (mi'mrā pāsōqā)	hukm, qadiyya, qawl jāzim, qawl qāti'

ibn al-Muqaffa'	al-Kindi	Ikhwān aṣ-Ṣafā'	al-Farabi
ikhtilāf	(tanāṣub)	taqābul	mutaqābilān
al-ikhtilāf al-'āmm		mutaḍāddān, aḍdād kubrā	mutaḍāddān
al-ikhtilāf al-khāṣṣ		aḍdād sughrā	mā taḥta 'l-mutaḍāddayn
al-ikhtilāf al-mutanāqiḍ	mutanāqiḍān	mutanāqiḍān	mutanāqiḍān
al-ikhtilāf al-mutadākhil		mutatāliyatān	
'āmm		al-kull	kullī
khāṣṣ		al-juz'	juz'i
			shakhṣ
makhṣūṣ		makhṣūṣ	shakhṣi
ism, ḥadd mawḍū'	ḥāmil, mawḍū'	mawṣūf, mawḍū'	mawḍū'
ḥarf, ḥadd maḥmūl	maḥmūl, maqūl	ṣifa, maḥmūl	maḥmūl
ḥarf	ḥarf	fi'l, kalima	kalima
			ism mustaqīm
	taṣrif		ism mā'il
(ghayr) maḥdūd		(muḥaṣṣal)	(ghayr) muḥaṣṣal
muhmal		muhmal	muhmal
sūr		sūr	sūr
muthbit, mūjib	mūjib	ijāb	mūjib
mubṭil, sālib	sālib	salb	sālib
ijāb mukhālif(?)			ma'dūl
al-umūr ath-thalātha		al-'anāṣir ath-thalātha	al-mawādd ath-thalātha
wājib		wājib	ḍarūrī
mumtani'		mumtani'	mumtani'
mumkin		mumkin	mumkin
qaḍiyya, khabar	qaḍiyya, khabar (mukhbir min al-qawl)	khabar, ḥukm, qawl jāzim, qaḍiyya (jāzima)	qaḍiyya

ḥayyun; wa-min ʿādati ʾl-faylasūfiyyīna an yusammūwu ʾl-isma ʾl-ḥadda ʾl-mawḍūʿa wa-l-ḥarfa ʾl-ḥadda ʾl-maḥmūl [for every sentence has two terms, of which one is the noun and the other the verb predicated of the noun, e.g. "Fulān is alive". It is use among philosophers to call the noun "the subject term" and the verb "the predicate term"].

This invocation of philosophical conventions of speech could, theoretically, have been part of a Greek or Syriac original from which ibn al-Muqaffaʿ translated it. But it comes much more naturally to attribute it to himself.[37] It appears, then, that ibn al-Muqaffaʿ knew philosophers who had already built up a logical jargon in Arabic. From them he picked up some basic terms before or during the compilation of his work, which is an introduction for laymen by a layman.

Another pair of such terms recorded by him are *mūjib* for "affirmative" and *sālib* for "negative".[38] Himself he uses *muthbit* [affirming] and *mubṭil* [invalidating], apparently because he considers them more appropriate or easier to understand. It is possible that for other concepts (such as "universal" and "particular") the terms used by al-Farabi were also already in existence, while ibn al-Muqaffaʿ preferred simple Arabic terms to unnecessary neologisms. Such concepts as "quantifier", "indeterminate" and the like are, of course, so highly technical as to have to be understood from the context of the theory, whatever the terminology. I take it, therefore, that ibn al-Muqaffaʿ in such cases silently adopted the terms used by the philsophers he refers to in the above quotation.

If it was not ibn al-Muqaffaʿ who created the oldest layer of logical terminology in Arabic—who did it? Was it translators? The only translation of considerable age pertinent to our sector of terminology is that of *An. Pr.* In it the terms *muhmal, maḥmūl, mūjib* and *sālib* occur. Does ibn al-Muqaffaʿ depend on the translator of *An. Pr.* or vice versa?

The term *muhmal* [unprovided, neglected] occurs right in the definitory opening of the book, rendering ἀδιόριστος.[39] According to the translators' normal practice a word like ἀδιόριστος would be translated literally. The preposition διά would be neglected, as there are no composites in Arabic; and ὅριστος would be rendered as *maḥdūd* because of the old established equation ὅρος: *ḥadd* [edge, border]. Thus we would expect *ghayr maḥdūd* for ἀδιόριστος, and this is what we find in *An. Pr.* in several places instead of (or together with) *muhmal*.[40] Now we must bear in mind that it is in the revised version of the Baghdad school that we have Theodore's old translation of *An. Pr.* The fact that *muhmal* does not occur in other Aristotelian translations, and in *An. Pr.* only in a minority of

places indicates that it was put in these places by a later editor to replace *ghayr maḥdūd*. There is evidence to support this assumption.[41]

Maḥmūl [carried] too is not a literal translation of Aristotle's corresponding term (κατηγορούμενον). Literal translation according to the familiar pattern—neglecting the prepositional prefix and rendering the verbal root—yields *maqūl* [said].[42] This is the way of rendering κατηγορούμενον (and other forms of κατηγορέω accordingly) followed by Theodore in most places,[43] particularly in 24ᵇ17, where Aristotle puts forward the division of a premiss into a subject term and a predicate term. If this is the place to which ibn al-Muqaffaʿ alludes in the quotation above, then the reference is not to Theodore's translation. It is fairly obvious that Theodore had used forms of *qāla* throughout and that such forms of *ḥamala* as do occur are due to later substitution.[44]

The terms *mūjib* [necessitating, ascertaining] and *sālib* [taking away] for "affirmative" and "negative" have probably not been invented by Theodore. For in *An. Pr.* Aristotle uses interchangeably two pairs of terms (καταφατικός—ἀποφατικός and κατηγορικός—στερητικός) both of which are always rendered alike as *mūjib* and *sālib*.[45] This shows that it is the technical, not the literal, meaning of these pairs of terms that is represented by a pair of terms of equal technical meaning (though *sālib* could pass as a literal translation of στερητικός). It follows that the Arabic words had been introduced as technical terms before this translation of *An. Pr.* was made. Hence there is no need to assume that ibn al-Muqaffaʿ drew on it.[46]

After it has been established that not only the oldest extant logical treatise but also the (probably) oldest extant logical translation in Arabic show traces of a conventional vocabulary existing before them, an attempt to go back any further may seem futile. Yet the terms of our set share some striking characteristics which encourage such an attempt. They are all (with the exception of *mawḍūʿ* and *mutanāqiḍ*[47]) odd on two counts: none of them is a literal translation of a standard Greek equivalent (if we did not know the equivalent we would be unable to guess it), and yet this is not caused by Arabic usage (where Arabic equivalents to the original terms suggest themselves it is not the expressions adopted by the logicians). The first characteristic suggests that whoever introduced these terms was not, strictly speaking, a translator, the second that he was not an Arab. It is Syrian teachers whom it comes most naturally to think of as satisfying both these conditions.

This hypothesis makes sense. An 8th century Syrian would philosophize in Syriac. Presumably, he would know no Greek or just the spoken language of the time. Now we see that the Syriac equivalents of most of

the "odd" terms in question are transliterated or assimilated Greek words, i.e. foreign words in the strict sense or loan-words (*qaṭreg* < κατηγορέω). Foreign words are adopted because they are hard to translate in the first place. A Syrian who, moreover, used Greek words without knowing Greek properly would be hard up for a literal translation in each case. He would have to try to put the idea across somehow and, not being a native speaker of Arabic, he would often succeed only roughly and crudely. Hence the occasional "odd" term. All these odd terms (with the exception of *mumtaniʿ*) are key terms which had to be used in logical discourse all the time. Thus they took root before able translators set to work who might have come up with expressions closer to the original terms or in better accordance with Arabic usage. However, the course of events was such that in fact the translators of logical texts were influenced by the basic technical language already developed by teachers of logic.

Maḥmūl is not a literal translation of κατηγορούμενον and is not a term used in Arabic grammar for the concept of a predicate.[48] To begin with, translators expressed the concept of predication by means of words meaning "description, attribute" (*naʿt*, *ṣifa*)[49] or else, as we have seen, by way of literal translation with forms of *qāla* [say]. Later, the root of *ḥamala* penetrated from the usage of logicians into the language of translators and so successfully superseded the earlier attempts that for Usṭāth and all later translators κατηγορέω: *ḥamala* had become a common equation.[50] Why *ḥamala* was chosen in the first place is open to guesses. The choice may be just unaccountable, but it may also be based on the every day meaning "to accuse" of κατηγορέω as well as the loan-word *qaṭreg* in Syriac (for *ḥamala ʿalā* [lit. to carry upon/against] can mean "to impose, charge, attack") or on the use in Greek philosophy of φέρω κατά/πρός in the meaning "to apply (a term) to".[51]

Aristotle's terms κατάφασις/καταφατικός and ἀπόφασις/ἀποφατικός can hardly be translated literally into Syriac[52] or Arabic. The Arabic choice of words is unaccountable, unless the pair *mūjib-sālid* is based on the alternative pair κατηγορικός—στερητικός of *An. Pr.* (*sālib* translating στερητικός, *mūjib* being a substitute for an unviable literal translation of κατηγορικός[53]). All translators adopted the logicians' pair of terms.[54] That it struck a speaker of Arabic as odd is shown by the fact that ibn al-Muqaffaʿ only mentions, not uses, these terms. The only alternative rendering among the sample taken from the translations offers the pair of terms most appropriate from the point of view of Arabic: *ithbāt* [confirmation, affirmation] and *nafy* [negation].[55]

The meaning of *sūr* is "wall" (preferably a wall surrounding a town). There is no obvious connection between this term and its Greek counter-

part, προσδιορισμός, which means some additional specification and, in this fixation, a quantifying expression adjoined to an elementary sentence.[56] However, remembering the method primarily followed in the translation of Greek composites into Syriac and Arabic, namely, stripping them down to their nominal or verbal roots and translating these, we can let "wall" pass as not even far-fetched a metaphor for the meaning of ὁρισμός. Still, seen as a translation *sūr* remains a crude term (apart from being abnormal as an equivalent of ὁρισμός).[57] How it was understood by those who used it is borne out by the neighbouring term *maḥṣūr* [enclosed, surrounded, contained] used by ibn al-Muqaffa'[58] and later authors for "quantified"; and by the Hebrew translation *heqqēph* [circumference].[59] *Sūr*, then, is to be understood as something to define the scope of a content by demarcating its circumference. We find the same metaphor in Paulus Persa's term for "unquantified, indeterminate", whose literal meaning is "not surrounded with a fence". We will wonder whether *sūr* is a case of a Syriac metaphor[60] transferred into Arabic. I suspect that this is the only promising lead and that further elucidation would have to come from a scrutiny of more Syriac texts.

Of the great number of different roots employed in the translations to render the various derivations and composites of ὁρίζω (see n. 57) none is taken from the sphere of the concrete metaphor of surrounding with a fence or wall. This indicates that the terms *sūr* and *maḥṣūr*, if they were known to the translators, were not connected in their minds with the Greek originals and that these terms are not likely to have been designed by a translator in the first place.

Muhmal is not a translation at all. Of the Greek term ἀ(προς)διόριστος it expresses nothing but the *alpha privativum*. A *muhmal* proposition is "a proposition without", sc. without a *sūr*. The literal translation *ghayr maḥdūd* would not do, as it had been assigned to the concept of an "indefinite" (ἀόριστος) noun or verb. But it is a puzzle why different roots were used to express "quantified" and "unquantified". As an Arabic term, *muhmal* seems adequate enough. In grammar, *muhmal* is said of a letter without diacritical points, and in the science of *Ḥadīth* (critical collection of reports from Muḥammad), reports of insufficient authenticity due to some deficiency or fault in its indication of transmitters can be classified as *muhmal*.[61] Thus this word is quite well suited to convey the idea of indeterminateness.

For a literal translation of ἀδύνατος, we should expect *ghayr mumkin*, for a simple equivalent, we should expect *muḥāl*. By and large, these are the options between which the translators choose.[62] *Mumtani'* [prevented] is found only exceptionally.[63] Apparently, this term was introduced and

transmitted just within the context of the topic of "the three material modes". This is why it is used by Isḥāq in translating the passage of *De Int.* concerned with modality. Another term tied to a topic is *qawl jāzim* (or *qāṭiʿ*). This expression is an exact translation of Syriac *miʾmrā pāsōqā* [cutting, i.e. decisive phrase], which stands for λόγος ἀποφαντικός in the Syriac versions of the Peripatetic (post-Aristotelian) list of the five kinds of sentence.[64] This list, distinguishing between the statement and four other kinds of sentences, is one of the most popular topics of the theory of propositions developed out of and around *De Int.* It is not missing from any of the texts which have been taken into account.[65] Therefore, Isḥāq may well be taken to betray some knowledge of logical doctrine (of Syrian origin) when he employs *qawl jāzim* to render λόγος ἀποφαντικός (*De Int.* 17ᵃ6–15). For ἀπόφανσις and ἀποφαίνομαι, he uses *ḥukm* judgement and *ḥakama*. However, neither expression is very common elsewhere among the translators. Outside *De Int.*, we find for ἀποφαίνεσθαι and its derivates only single instances of *ḥukm*, its synonym *qaḍiyya*, and *qawl qāṭiʿ* amidst a number of other attempts, some blanks, weak renderings and paraphrases.[66] There was no common translators' formula, and it is unlikely that it was as equivalents of Aristotle's ἀπόφανσις that either *ḥukm/qaḍiyya* or *qawl jāzim* had become terms of logic.[67]

Why Isḥāq preferred *ḥukm* to *qaḍiyya* is obscure. From ibn al-Muqaffaʿ's and al-Farabi's usage[68] as well as from the spontaneous occurrences in some translations (see n. 67) *qaḍiyya* emerges as the most regular term for "proposition, statement" in Arabic logic.[69] It is not a literal translation of ἀπόφανσις, but it could go back to the Stoic term ἀξίωμα, which was used by late Greek authors in interchange with πρότασις and ἀπόφανσις.[70]

The best way of accounting for the oddity of the terms discussed remains the assumption that they were created *ad hoc* by Syrians who had to convey logical doctrines to speakers of Arabic for the first time. We have seen that by the time of ibn al-Muqaffaʿ such terms had already become conventional and were part of a basic technical language of logic which was not without influence on the translations of Aristotle's works and was never completely superseded.

※   ※   ※

Al-Farabi's work marks the end of the incubation period of logic in the Arabic language. It was to the dim picture of this incubation period that the microscopic analysis of al-Farabi's passage was intended to add some colour. The investigation of its topic as well as its terminology has led us to see a Syrian tradition of teaching behind it first traces of which

are to be discovered in ibn al-Muqaffa''s vocabulary. We gather that it was Syrian teachers who created the first technical terms and who formed a major channel for the transmission of traditional logical doctrine, perhaps largely on an oral basis.

We have not, from the preceding investigation, gained a very high opinion of the philosophical standards of this teaching tradition, nor can al-Farabi be spared the blame of having at least repeated some fairly patent nonsense. But it is precisely the obscurities and the general low standard of understanding in this latest stage of Hellenistic Aristotelianism that made it necessary to turn back to Aristotle himself, and it is only with view to these standards that we can appreciate al-Farabi's achievements in doing just that. It is probable that he included his teachers in his criticisms of some of the views of "the commentators". There are also signs that he regarded as inessential some of the traditional points of discussion, though he paid his respects to tradition by relating them. His report of the dispute about whether or not the vocative is properly listed as a sentence type closes with the words (*Comm.* 52,5): "But we must not go on about this, for it is not our concern to establish the correct number of sentence types."

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[1] W. Kutsch and S. Marrow (edd.), Alfarabi's Commentary on Aristotle's *De Interpretatione* (Beyrouth, 1960) (=*Comm.*), 64,1–65,6.

[2] In Greek, we have the commentaries of Ammonius (d. *c.* 520) (In Aristotelis De Interpretatione commentarius, ed. A. Busse, Commentaria in Aristotelem Graeca iv, 5, Berlin, 1897) and Stephanus Alexandrinus [7th cent.] (Stephani in librum aristotelis De Interpretatione commentarium, ed. M. Hayduck, Comm. in Ar. Gr. xviii, 3, Berlin, 1885). Another Greek source is quoted by Boethius [d. 525] (In librum Aristotelis De Interpretatione libri sex. Editio secunda. In: Migne, Patrologia Latina, vol. lxiv, Paris, 1891, 553 ff.). For the Syrian period we can use the commentary of Probha [5th cent.] (in: J. G. E. Hoffmann, De hermeneuticis apud Syros Aristoteleis, Leipzig, 1869) and the short logical treatise by Paulus Persa [6th cent.] (Pauli Persae logica. In: J. P. N. Land, Anecdota Syriaca, vol. iv, Leiden, 1875, Syr. 1–33, Lat. trl. 1–30), which covers the subject matters of *Eisagoge*, *Cat.*, *De Int.* and *An.Pr.*. Both these texts are published with a Latin trl. In Arabic, we have an unpublished work by the son of ibn al-Muqaffa' [2nd half 8th cent.], which also covers the ground of the first four books of logic. This is the oldest logical text extant in Arabic (I am grateful to the Oriental Library of the University St. Joseph, Beirut, for providing me with a microfilm of their MS. no. 338. It is on the basis of the subscription of this MS. that P. Kraus, *Zu ibn al-Muqaffa'*, in: Rivista di Studi Orientali 14 (1933–4), 1–20, suggested author and date of the work as stated. So far I have found no reason to doubt the validity of Kraus' conclusion). Al-Kindi has very briefly summed up the contents of *De Int.* in his survey of Aristotle's writings (*Risāla fī kammiyya kutub Arisṭū*. First published by M. Guidi and R. Walzer: *Studi su al-Kindi I*. Memorie d.R. Accad. d. Lincei, Rome, 1940; again edited by M. Abū Rīda in: Rasā'il al-Kindī al-falsafiyya, vol. I, Cairo, 1950, 363–84). This summary, with some additional lines, has been incorporated by al-Ya'qūbī [d. 897] in his *History* (*Ta'rīkh*, ed. M. T. Houtsma, vol. I, Leiden, 1883, 145 f. M. Guidi and R. Walzer have noted the relationship and compared the texts in: *Studi su al-Kindi I*). In a simi-

lar manner but at greater length the subject matter of *De Int.*—among those of the other books of logic—is treated in the *Rasāl'il* of the Ikhwān aṣ-Ṣafā', contemporaries of al-Farabi (*Ar-risālat ath-thāniya 'ashrata min al-qism ar-riyāḍī fī ma'nā bārimāniyās wa-hiya 'r-risālat ath-thālitha min al-manṭiqiyyāt*. In the ed. Cairo, 1347/1928, vol. I, 331–5). Finally, of the exegetical activity of the Baghdad school of Syrian philosophers we have a record in the marginal notes of the Paris MS. (Bibl. Nat. no. 2346) of the *Organon* in Arabic (all of which, except those in *De Int.*, have been published by Georr and Badawi together with the translations [see below]. I am grateful to Dr. Walzer for letting me use his microfilm of the *De Int.* part of the Paris MS. (folios 179[a] ff.), and to the Oriental MSS. department of the Bibliothèque Nationale for letting me read in the original the bits illegible in the microfilm). For the comparison of Arabic terms, the following works of Aristotle will be consulted in their Arabic versions: the books of the *Organon* (ed. 'Abd. Badawi, *Manṭiq Arisṭū*, 3 vols., 1949–52. For the *Cat.*: Kh. Georr, *Les Catégories d'Aristote dans leur versions syro-arabes*, Beyrouth, 1948; for *De Int.*: I. Pollak, *Die Hermeneutik des Aristoteles in der arabischen Übersetzung des Isḥāq ibn Honain*, Leipzig, 1913), the *Physics* (ed. Badawi, 2 vols., Cairo, 1964 f.), *De Anima* (ed. Badawi in: Islamica 16, Cairo, 1954), the *Metaphysics* (in: Averroès, *Grand commentaire de la métaphysique*, ed. M. Bouyges, 3 vols., Beyrouth, 1938–52 [Bibliotheca Arabica Scholasticorum v-vii]) and the *Rhetorics* (ed. Badawi, Cairo, 1959). Of these works only the translation of *An. Pr.* could be as old as the work of ibn al-Muqaffa'. It was made by a man whose name (*T·dh·r·y*) has not been identified conclusively so far. If Kraus' suggestion is right he was *Theodore abū Qurrā* (*Zu ibn al-Muqaffa'*, p. 3, n. 3), who was an old man in the first decades of the 9th century. The other translators we meet are the *anonymi* of the "old" translations of the *Rhet.* and *Soph. El.* (the latter reported to have been attributed to *an-Nā'ima*, a contemporary of al-Kindi); *Usṭāth*, a contemporary of al-Kindi; *Isḥāq ibn Ḥunayn* (d. 910); *Abū Bishr Mattā*, an exponent of the Baghdad school of Syrian philosophers and older contemporary of al-Farabi; *ad-Dimashqī*, a contemporary of Isḥāq and pupil of Isḥāq's father Ḥunayn; *Ibrāhīm ibn 'Abdallāh al-Kātib*, an associate of ad-Dimashqī; *Yaḥyā ibn 'Adī* (d. 974), a pupil of A. Bishr and al-Farabi; *ibn Zur'a* (d. 1008), a pupil of ibn 'Adī's; *Naẓīf* (10th cent.], another member of the Baghdad school. [For the translators see R. Walzer, *Greek into Arabic*, Oxford 1962, 65 ff. ("New Light on the Arabic translations of Aristotle") and 119 ("On the Arabic Versions of Books A, α and Λ of Aristotle's *Metaphysics*")].

[3] For what is known about al-Farabi's background see the Encyclopedia of Islam[2], s.v. al-*Fārābī* (R. Walzer).

[4] E.g. *Comm.* 46,1; 63,21.

[5] Kitāb bārī armīniyyās ay al-'ibāra. Ed. (with turkish introd. and trl.) Mübahat Küyel: Fārābi'nin Peri Hermeneias Muhtasari. Ankara Üniversitesi Basimevi, 1968 [Araştirma IV, 1966] (=*K. al-'ibāra*).

[6] *Comm.* 63,15 ff.

[7] It is by way of a slight inconsistency that "no" is called a quantifier together with "every" in § 4. It is true that we use "no" to begin a universal negative statement, but in doing so we have gone over from the negative statement with the universal quantifier to its equivalent, the positive statement with the negated particular quantifier. The dividing line between logical and linguistic structure of an expression is not clearly drawn, perhaps not clearly seen—a familiar characteristic of ancient logic. Thus it was a habit from Greek times to enumerate four quantifying expressions rather than two (cp. Ammonius 89,7: "Therefore, they ⟨sc. the quantifiers⟩ are four in number, 'every' and 'no', 'some' and 'not every'.").

[8] The list of "necessary", "possible" and "impossible" is based, according to Ammonius (215,11 ff.), on the argument that "a predicate must hold of a subject either always or never or just occasionally".

[9] It is interesting to see that it is the "ancient" concept of *matter* that lived on, in the context of our topic, in Syriac and Arabic. Probha and Paulus Persa simply transliterate

ὕλη; ibn al-Muqaffaʻ talks of "the three *umūr*" [affairs, matters], the Ikhwān aṣ-Ṣafāʼ of "the three *'anāṣir*" (*'unṣur* [element] being one of the words used by older translators such as Usṭāth to render ὕλη). This could indicate that all these versions of the proposition count, including that of al-Farabi, go back to models earlier than Ammonius. (We shall see that Probha's and Ammonius' versions are very similar. Hence a model common to both of them has to be presupposed anyway if Hoffman [p. 144] is correct in his conclusion that Probha wrote before Ammonius.)

¹⁰ P. 75,8: wa-l-jihātu 'l-uwalu thalāthun: aḍ-ḍarūriyyu wa-l-mumkinu wa-l-muṭlaq [there are three primary modifiers: the necessary, the possible and the absolute]. From the ensuing discussion it emerges that al-Farabi means to say that these are the three *material* modalities. The necessary and the possible are made explicit through modifying expressions, the "absolute" through the absence of any such expression. Thus the third modifier is really a zero-element. (The zero-modifier is not counted in *Comm.* 163,17 pass.) That this list of modalities derives directly from *An. Pr.* 25ᵃ1 is evident when we look at the Ar. trl.: *Kullu muqaddamatin immā an takūna muṭlaqatan wa-immā iḍṭirāriyyatan wa-immā mumkina-tan* [every premiss is either absolute or necessary or possible]. Apparently the translator found it difficult to render τοῦ ὑπάρχειν. Therefore, he supplied ἁπλῶς in the first instance and then transformed the sentence: . . . ἐστιν ἢ ἁπλῆ ἢ ἐξ ἀνάγκης ἢ ἐνδεχομένη. Al-Farabi's mention of an "absolute" modality is evidence to show that it is in this trl. (used in the Baghdad school of Syrian philosophers) that he studied *An. Pr.*

¹¹*Muḥaṣṣal* [produced, brought forth] and its opposite *ghayr muḥaṣṣal* [cp. W. Kutsch, *Muḥaṣṣal—Ghayr muḥaṣṣal*, in: Mélanges de l'Université St. Joseph Beyrouth XXVII, 9 (1947–8), 169–76, where the meaning "definite—indefinite" is elaborated from numerous examples] apparently owe to Isḥāq their introduction as terms of Arabic logic. Wherever ἀόριστος occurs in *De Int.* it is rendered as *ghayr muḥaṣṣal*. This is sufficient to explain how this expression became the technical term for Aristotle's peculiar concept of indefinite noun or verb. When these were called *ghayr muḥaṣṣal* it went without saying that others were to be labelled *muḥaṣṣal*. [Already the Greek commentators had supplied ὡρισμένον (ὑποκείμενον/κατηγορούμενον) as an opposite of ἀδιόριστον, e.g. Stephanus 40,2 ff. Moreover *muḥaṣṣal* occurs both alone and in opposition to *ghayr muḥaṣṣal* in other translations of Ishaq's, e.g. *Cat.* 8ᵃ36 f., ᵇ9: *muḥaṣṣalan* for (ἀφ)ωρισμένως (as against A. Bishr: *maʻa 't-taḥdīd*, *An. Post.* 72ᵃ16), 8ᵇ4 *ʻala 't-taḥṣīl* for ἀφωρισμένως, *Phys.* 196ᵇ28 ὡρισμένος—ἀόριστος: *muḥaṣṣal maḥdūd—ghayr muḥaṣṣal wa-lā maḥdūd*. On such examples is based al-Farabi's free use of *(ghayr) muḥaṣṣal* in the meaning of "(in)definite", and of *ʻala 't-taḥṣīl* in the meaning of "definitely"—cp. *Comm.* 230 (index), s. vv.] The translator's choice of expression is odd; we should expect *ghayr maḥdūd* for ἀόριστος. In fact, this is the rendering we find in all translations before Ishāq's and in ibn al-Muqaffaʻ [*An. Pr.* 32ᵇ12,17, *De An.* 424ᵇ15, *Metaph.* 989ᵇ18 (Naẓīf), 1037ᵃ27, 1007ᵇ29 *alladhī lā ḥadda lahu* (Usṭāth), *Rhet.* 1366ᵃ2; *Phys.* 201ᵇ24–28 (Ishāq): *lā ḥadda lahu* (as against 184ᵇ1: *ghayr muḥaṣṣal*). Ibn al-Muqaffaʻ: *al-asmāʼ*: *ghayr al-maḥdūda* [indefinite nouns] (70,3), *al-ḥurūf ghayr al-maḥdūda* [indefinite verbs] (71,10)]. It is not difficult to understand this change of translating practice: As an equivalent of ὅρος/ὁρισμός, *ḥadd* had acquired the technical sense of "defini-tion", which soon prevailed in its philosophical use. Thus for later translators with some knowledge of the language of philosophy *ghayr maḥdūd* would mean "undefined, without definition" rather than anything else, and they would think of a different rendering whenever they did not think that ἀόριστος meant just that in a given place.

¹² *De Int.* 16ᵃ30 ff., 16ᵇ12 ff., ch. 10 pass. (19ᵇ5–20ᵇ13). Cp. *Comm. ad locos.*

¹³ See *Comm.* ad 19ᵇ37–20ᵃ1: p. 126, ll. 1–15.

¹⁴ *Ism mustaqīm* and *māʼil* for *casus rectus* and *obliquus* are terms which up to al-Farabi were probably not used outside the Baghdad school. (These terms were also applied to verbs. In the Paris MS. we find the gloss *ay al-mustaqīma* above *al-kalim* [f. 180a, l. 14] Al-Farabi adopted the terms in both applications: wa-l-ismu yakūnu māʼilan wa-qad yakūnu mustaqīman ... wa-l-kalimatu ayḍan qad takūnu mustaqīmatan wa-⟨qad⟩

mā'ilatan [*K.al-'ibāra*, 40; 43].) Their adoption is just one measure of the extent to which this school has modelled its technical language on that of Greek tradition. It is obvious that *mustaqīm* stands for εὐθύς or ὀρθός, but it can be shown even. In ibn Suwār's marginal comments on the *Cat. ism mustaqīm* occurs in a sentence which translates a sentence from Simplicius' commentary almost literally, the Greek counterpart to this expression being εὐθεῖα πτῶσις (*ibn Suwār* [Georr, 365 top]: wa-rasmu hādha 'l-kitābi 'l-maqūlātu wa-lam yursam fi 'l-maqūlāti aw bi-l-maqūlāti li-anna 'l-'ādata jāriyatun bayna 'l-qudamā'i an yusammūwu 'l-kitāba 'lladhī gharaduhumu 'l-kalāmu fīhi bi-*smin mustaqīmin* lā musarraf Simplicius [In *Cat.* 18, 3 ff.]: Κατηγορίαι δὲ ἐπιγέγραπται καὶ οὐ Περὶ κατηγοριῶν διὰ τὸ συνηθὲς εἶναι πολλάκις τὸ ὄνομα περὶ οὗ ὁ λόγος ἐπ' εὐθείας πτώσεως προγράφειν τοῦ συγγράμματος. As for the equivalent of *mā'il*, there are two likely candidates, the Stoic term πλάγιος λάγιος (cp. H. Steinthal, *Geschichte der Sprachwissenschaft bei den Griechen und Römern*, Berlin, 1863, p. 295) and the grammatical term ἐγκλινόμενος; mā'il would fit either of them as a translation.

¹⁵ E.g. Stephanus 11,1: . . . one must adopt the Peripatetics' opinion that the cases are four in number, while the *rectus* should be called "noun".

¹⁶ As a rule elliptically: ἡ εὐθεῖα/ὀρθή—αἱ πλαγίαι (for references see the indices s.v. πτῶσις). In one place (42,30), Ammonius supplies προφορά after εὐθεῖα, thus disowning its original connection with πτῶσις.

¹⁷ Stephanus 11,9 ff. Here as in most places Stephanus writes out Ammonius. As he is more concise reference is made to his commentary whenever it sufficiently illustrates the point in question.

¹⁸ For the Peripatetic and Stoic lists of the kinds of sentences see Ammonius, 2. The Peripatetic quinquepartition is mentioned in an Arabic note on *De Int.* in the Paris MS. and discussed by al-Farabi in *Comm.* 51 f. and *K. al-'ibāra* 45 f.

¹⁹ *Comm.* 106, 17: *wa-l-qadāyā 'llatī mahmūlātuhā ghayru muhassalatin tusammā 'l-ma'dūlāt* [statements whose predicate is indefinite are called deflected]. *Ma'dūl* cannot easily be translated into Greek and, what is more, it makes as little sense in Arabic as the rendering "deflected" does in English. That it does not mean "equivalent" as A. M. Goichon (Vocabulaires comparés d'Aristote et d'ibn Sīnā. Paris 1939, p. 18 s.v. *'udūl*) has suggested is secured by the gloss *al-mutaghayyiratayn* [the two which are changed] above *al-ma'dūlatayn* in a marginal note on *De Int.* in the Paris MS. (f. 185a). That it is not an Aristotelian term in the first place is attested by what we learn from the Alexandrian commentaries. Stephanus says (40,21 ff.): "Neither must the negative particle οὐ be placed with the predicate ⟨sc. of a 'ternary' proposition, in order to turn an affirmation into a negation⟩, for then again the outcome is an indefinite (ἀόριστος) affirmation, which Theophrastus has called ἐκ μεταθέσει, either because of the transposition of the negative particle οὐ from the additional third element ἔστιν to the predicate, or else for the reason that the order within the diagram is changed around. For no longer . . . does affirmation come under affirmation and negation under negation." (The diagram referred to is in *De Int.* 19ᵇ27 ff.:

      a man is just   (affirmation)—a man is not just (negation)
      a man is not not-just (negation)   —a man is not-just (affirmation)

Since the propositions of the second line are placed under their equivalents in content, the order of affirmation and negation is "no longer" that of the first line but converse.) Al-Farabi's definition of a *ma'dūl* statement explains it as a (ternary) statement with an indefinite predicate. Since this is exactly what is described here there can hardly be much doubt that *ma'dūl* was meant to render ἐκ μεταθέσει. Checking the occurrences of μετάθεσις and μετατίθεσθαι in Aristotle with their Arabic renderings we do not find *'adala* [to turn sideward] among the roots employed, but we do, in just one place, find *taghayyara* for μετατίθεσθαι used by both ibn 'Adi and ibn Zur'a in *Soph. El.* 182ᵇ39. We know from the subscription of *De Int.* in the Paris MS. (*Mantiq Aristū*, I, 99) that this text was copied from ibn Suwār's copy of ibn 'Adī's copy and was collated with that of ibn Zur'a. Whether the gloss first mentioned is due to either of them or not—it came from their circle, and we can

reasonably assume that it was meant to render ἐκ μεταθέσει, hence that *ma'dūl* was meant to render the same expression in the first place, and finally that the late Baghdadians still knew what it was meant to mean. (This could not necessarily be expected, since we find no explanation as to why a *ma'dūl* statement is so called.)

[20] Cp. *Comm.* 102,17 ff., where al-Farabi explains why the theory of deflected statements is difficult to demonstrate from Arabic, where nominal sentences without copula are frequent, whereas it is evident, as he believes, from languages articulating the copula always.

[21] *Mā taḥta 'l-mutaḍāddayn* [what is under the two contraries. Cp. Paulus Persa: *taḥeth saqubhlā* (Land 12, 13)] is as literal a trl. of ὑπεναντίαι (sc. ἀποφάνσεις or προτάσεις) as the Arabic language allows for. The term is found in the Greek tradition since Alexander of Aphrodisias (see C. Prantl, *Geschichte der Logik im Abendlande*, I, Leipzig, 1855, 625).

[22] αἱ ἀντικείμεναι αὐταῖς ⟨sc. ἐναντίως ἀντικειμέναις καταφάσει καὶ ἀποφάσει⟩—al-mutaqābilatān lahumā ⟨sc. li-l-mutaqābilayn 'alā ṭarīq at-taḍādd = li-l-mutaḍāddayn⟩.

[23] See S. M. Stern, 'Ibn as-Samḥ', in: *Journal of the Royal Asiatic Society*, 1956, 31–44.

[24] R. Walzer and S. M. Stern have studied the notes of the same Paris MS. on the *Cat.* and have come to the conclusion that those of them that constitute al-Ḥasan ibn Suwār's commentary are based on the commentary of Simplicius, but not directly. This may well be a typical case. See R. Walzer, "New Light", etc.

[25] Ibid., 78.

[26] The last few pages preceding sect. 2 of *Comm.* in Kutsch's and Marrow's editions are in evident disorder. Certainly, the portion containing the proposition count is part of the beginning of sect. 2 rather than the end of sect. 1.

[27] In Hoffmann's ed., Probha's commentary breaks off a few lines after the proposition count of sect. 2; but presumably his procedure in sects. 3 and 4 too was similar to that of the Alexandrians.

[28] There is a remark at the beginning of sect. 3 (*Comm.* 106,20 f.) saying that the number of ternary opposite pairs is twice that of binary pairs, but no trace of a count of modified propositions in sect. 4.

[29] Ammonius 219,21; Stephanus 55,21.

[30] Hoffmann, 143 ff.; A. Baumstark, "Syrische Commentare zur Eisagoge des Porphyrios", in: *Aristoteles bei den Syrern*, I, Leipzig, 1900, 142 ff. It is Baumstark's historical considerations rather than Hoffmann's comparison of arguments that carry weight in dating Probha earlier than Ammonius. When Hoffmann (144, under γ) points out that Probha agrees with Syrianus in the number 144, he fails to explain how it is that both Probha and Ammonius arrive at this number (which in their accounts covers binary propositions only, while being Syrianus' final result) by way of a calculation involving factors not even mentioned by Syrianus (according to Boethius).

[31] It has been pointed out already that Probha's and Ammonius' modality factors do not derive from Aristotle. Moreover, it is evident that time reference, material and formal modality are by no means independent elements of a proposition but partly imply or exclude each other. They must have been introduced secondarily to accommodate results and distinctions of post-Aristotelian discussions (particularly on modality) and special cases touched upon in *De Int.* itself (such as the *contingentia futura*). Without these factors, the common rudiment of all our proposition counts can be represented by the following formula:

$$
\begin{bmatrix} \text{Modality} \\ \text{factor} \end{bmatrix} \begin{bmatrix} \underline{} \\ \begin{bmatrix} - \\ \mathrm{οὐκ} \end{bmatrix} \text{ἔσται} \end{bmatrix} \begin{bmatrix} \begin{bmatrix} π\tilde{α}ς \\ τὶς \end{bmatrix} \begin{bmatrix} - \\ \mathrm{οὐ(κ)} \end{bmatrix} \begin{bmatrix} \text{ἄνθρωπος} \\ \text{Σωκράτης} \end{bmatrix} \end{bmatrix} \begin{bmatrix} \begin{bmatrix} - \\ \mathrm{οὐ} \end{bmatrix} \begin{bmatrix} \text{βαδίζει} \\ \text{δίκαιος} \end{bmatrix} \end{bmatrix}
$$

This can be regarded as a fair attempt to work out what there is of a systematic basis in *De Int.* Thus the original function of the proposition count would have been to provide a

systematic survey of proposition patterns derived according to Aristotle's recipe so as to guide the student through the semi-systematic discussions in *De Int.* of some of them. If there are, as this formula presupposes, $3 \times (3 \times 2 + 2) \times 2 = 48$ unmodified binary and ternary propositions, and if the number 144, as its recurrence suggests, was the final result of the prototype of all our proposition counts, a factor 3 is left to accommodate modality. Since unmodified propositions are to be counted in addition to modified ones, there can only be two modifiers. If there are to be three modalities, it is obvious that the calculation can only work out as long as unmodifiedness is counted as a modality. This is done by al-Farabi, as we have seen (n. 10), though in no connection with the proposition count. He says that it was Alexander of Aphrodisias who interpreted the "absolute" modality of *An. Pr.* 25^{a}1 as expressed by a zero-modifier (*K. al-'ibāra*, 77). Seeing that the account given by Boethius (whose *qualitates* represent the modalities of *An. Pr.* 25^{a}1) presupposes this theorem we may wonder whether the prototype of the proposition count (with 144 as a result) goes back to Alexander (± 200 A.D.).

[32] We are informed through the Arabic biographical tradition that al-Farabi referred his own school back to that of Alexandria (see M. Meyerhof, *Von Alexandrien nach Bagdad*, in: Sitzungsber. d. Preuss. Ak. d. Wiss., phil.-hist. Kl. 23, 1930). There is textual evidence for a special relationship between Alexandria and Baghdad (see, e.g., R. Walzer, "Zur Traditionsgeschichte der Aristotelischen Poetik", in: *Greek into Arabic*, 129–36). Our passage is corroborative only in so far as it may, but need not, go back to the Alexandrians.

[33] Baumstark (*Aristoteles bei den Syrern*, 161) seems to be implying that Paulus Persa's treatise is based on a logical compendium in Syriac by Sergius of Ra's'ayn (d. 536).

[34] Of the two possibilities envisaged by Kraus (loc. cit.)—that it is either an epitomizing trl. or the trl. of an epitome of some commentary—the second can be dismissed. We shall see that there is an element of explanation which is most naturally attributed to ibn al-Muqaffaʻ himself. Hence the arrangement of the material is likely to be his own. The book may be a "translation" only in the very weak sense that ibn al-Muqaffaʻ gave the final linguistic form to bits of information gathered from various sources, possibly including oral ones too.

[35] A connection between them is suggested by the recurrence of certain peculiar terms; different sources are (for the Ikhwān) presupposed by striking variations of terminology (cp. the table of terms below). Al-Farabi is certainly as independent of al-Kindi and the Ikhwān as he is of ibn al-Muqaffaʻ.

[36] Essentially, this rubric is based on a survey of the books of Aristotle mentioned in n. 2 with the help of Bonitz' Index *Aristotelicus*. Some minor variants and unrepresentative alternatives have been omitted.

[37] It is hard to imagine that the misunderstanding expressed here (i.e. the erroneous view that "noun-verb" and "subject-predicate" are interchangeable pairs of terms) should have been found in a Greek text. It originates from a failure to grasp what a "verb" is, due to an unfortunate turn of phrase in translating an example. For in his paragraph on the verb (71,5), ibn al-Muqaffaʻ gives the adjective *saḥīḥ* [sound] for an example of a verb, where Aristotle has ὑγιαίνει. This is because a sentence like Φίλων ὑγιαίνει would normally be rendered in the form of a nominal sentence, as *Fulānun saḥīḥun*. It is true that the same mistake could have been made by a Syrian. In fact, both Syriac translations of *De Int.* (16^{b}9) published by Hoffmann use the predicative form of the adjective meaning "sound" to render τὸ ὑγιαίνει [da-ḥalīm]. Still, this has not caused Probha or Paulus Persa to mix up noun and verb with subject and predicate. If we assumed that ibn al-Muqaffaʻ's work is a trl. as it stands, we would have to presuppose an incredibly inferior Syriac substratum. Therefore, it is easier to take it that, whatever his sources, it was ibn al-Muqaffaʻ who arranged and shaped the material compiled. With him it is not so amazing that he should have been given to blunders, approaching as he did a subject unknown and foreign to him.

[38] 163,9: summiya 'l-muthbitu mūjiban li-ījābihi 'sh-shay'a li-sh-shay'i . . . wa-summiya 'l-mubṭilu sāliban li-salbihi 'sh-shay'a 'ani 'sh-shay'.

[39] 24ª17: οὗτος ⟨sc. λόγος = πρότασις⟩ δὲ ἢ καθόλου ἢ ἐν μέρει ἢ ἀδιόριστος: *wa-hiya ⟨sc. al-muqaddama⟩ immā kulliya wa-immā juz'iyya wa-immā muhmala*. Also 25ª5, 26ª30, 35ᵇ15; together with *ghayr maḥdūd* [undefined]: 26ª28. Outside *An. Pr.* I have come across *muhmal* in one related place only: In *Rhet.* 1415ª14 τὸ ἀόριστον is rendered as *al-kalām alladhī lā yakūnu maḥdūdan* [sentences which are not defined], with the addition *lākinnahu innamā yakūnu muhmalan . . .* [but they will be indeterminate], a gloss incorporated in the text which seems to indicate that τὸ ἀόριστον in this context was interpreted as λόγος ἀδιόριστος in the sense of *An. Pr.* and that *muhmal* was the word used to express this concept outside strict translation.

[40] 26ª32, 39, ᵇ23 f., 29ª6, 8.

[41] We find a note in the Paris MS, spelling out τὸν εἰρόμενον τρόπον: 'ala naḥwi mā qulnā of 24ª29 by repeating 24ª17 (*Manṭiq Arisṭū* [Badawi], I, 106 n. 5): *ya'nī immā kullī wa-immā juz'ī wa-immā ghayr maḥdūd* with *muhmal* above *ghayr maḥdūd*. In the present recension, we find *muhmal*, not *ghayr maḥdūd*, in 24ª17 as we have seen. The note has apparently preserved the original wording of the translation to which the regular term of the logicians has been attached by the Baghdad editor. In another note, he quotes in Arabic two variants from three Syriac translations, translating by himself, that is to say, these bits into Arabic (op. cit., 116 n. 2 [ad 26ª30]). In both quotations he uses *muhmal*, while *ghayr maḥdūd* is preserved in the corresponding place of Theodore's version. That an expression corresponding to *muhmal* rather than to *ghayr maḥdūd* was in each of the three Syriac versions referred to is not to be expected. Presumably, the Syriac expression in question was a more or less exact equivalent of *ghayr maḥdūd*. To the member of the Baghdad school, however, *muhmal* was so firmly established a term that he would not render the Syriac expression literally. It may be noted at random that al-Farabi's observation that the term *muhmal* is found in *An. Pr.* is evidence to show that he used Theodore's trl. in the revised version of the Baghdad school.

[42] This is what happened to the name of the first book of the *Organon*, which became known to the Arabs as *Kitāb al-maqūlāt* [the book of saids/sayables]. *Maqūla* then became and remained the technical term for "category". This could explain, to some extent, that *maqūl* did not catch on as a term for "predicate".

[43] Typical 24ᵇ17: τὸ τὲ κατηγορούμενον καὶ τὸ καθ' οὗ κατηγορεῖται—*al-maqūl wa-lladhī yuqāl 'alayhi 'l-maqūl*. Sim. 24ᵇ29, 25ᵇ39, 41ª8, 10, 43ª30, 34, 38 as against 24ª15 (*maḥmūl*),43ª26 (*tuḥmal 'alā*).

[44] There is again some evidence from notes and glosses on the first occurrence (twice in a sentence) of *maḥmūl* in the Baghdad text of *An. Pr.* (24ª15. *Manṭiq Arisṭū*, I, 104 nn. 3–5, 7). The editor has again collated a Syriac variant, which he translates into Arabic using *maḥmūl* both times, where the Syriac is likely to have had a Greek loan-word; whereas another variant, this time apparently from another Arabic copy of Theodore's translation, has *maqūl* both times.

[45] E.g. 24ª16, 26ª18, 31, 27ᵇ12, 58ᵇ15, 60ᵇ27.

[46] The question of the relative age of the translator of *An. Pr.* and ibn al-Muqaffa' remains unanswered. The fact that the translator knew fewer technical terms could indicate that he was older than ibn al-Muqaffa'. Yet this could also be because the translator was not a logician (and the translation is by no means so intelligent as to point to the contrary), or because he was just not very familiar with the existing Arabic jargon.

[47] *Mawḍū'* [put (part.)] is a literal translation of ὑποκείμενον (according to the familiar pattern), corresponding with the Syriac terms *haw de-sīm* [that what is put] and *mettə-sīmānīthā* [what is put]. *Mutanāqiḍān*, on the other hand, is not a literal translation of ἀντίφασις (or a Syriac equivalent), but it is taken from the Arabic root most apt to express the concept of "contradiction". Probably, derivations from this root had been used in the semi-logical discussions of Muslim theology in a sense very close to the strict logical concept before an Arabic logical language came into being. No doubt, both terms were part of the technical vocabulary of Arabic logic from a very early time. But each of them is too

obvious a choice of expression to signify a relationship between two texts in which they occur. Therefore, they are of no further interest in the present context.

[48] A suitable pair of terms offered by Arabic grammar for the concepts of predicate and subject are *al-musnad* and *al-musnad ilayhi* [what is leaned—what is leaned upon]. Terms of Arabic grammar were known to educated persons outside grammatical circles at quite an early stage. Ibn al-Muqaffaʿ, e.g., knows the term *musnad ilayhi* (71,4: *Wa-lā yakūnu ⟨sc. al-ḥarf⟩ illā maḥmūlan ghayra musnadin ilayhi* [a verb will always be a predicate, not a subject]). The pair *mawḍūʿ-maḥmūl*, apart from striking an Arab as odd, must have been unsatisfactory to his sense of terminological symmetry. It is worth contemplating what the logicians' failure to adapt their language to accepted standards of expression meant for the acceptability to Arabs of the foreign discipline of logic.

[49] *naʿt: Soph. El.* (anon.) 179ᵃ8 (τὸ κατηγορούμενον); *ṣifa: An. Pr.* 41ᵃ12, ᵇ31, 45ᵇ34 (κατηγορία).

[50] E.g. *Cat.* 1ᵇ10, 23, *De Int.* 20ᵇ31, *An. Post.* 81ᵇ24, *Top.* 109ᵇ6 (ad-Dimashqī), *Soph. El.* 179ᵃ8 (ibn ʿAdī, ibn Zurʿa), *Metaph.* (Usṭāth) 1023ᵇ31 (tuḥmal), 1040ᵃ24, 26 (tuḥmal bi-l-qawl); κατηγορούμενον-*maḥmūl: Cat.* 3ᵇ4, *De Int.* 17ᵇ12, *An. Post.* 73ᵇ17, *Top.* 102ᵃ32 (ad-Dimashqī), *Phys.* 189ᵃ31, *Metaph.* 999ᵃ5 (Usṭāth); κατηγορία-*ḥaml: An. Post.* 82ᵃ20, *Top.* 109ᵇ5 (ad-Dimashqī), *Metaph.* (Usṭāth) 1007ᵃ35 (annahu maḥmūl); κατηγορήμα(τα): maḥmūl *De Int.* 20ᵇ32, al-ḥumūl (ibn ʿAdī), aṣnāf al-ḥaml (ibn Zurʿa) *Soph. El.* 169ᵇ5, al-maḥmūlāt (Usṭāth) *Metaph.* 128ᵃ33. In one place, A. Bishr goes as far as to render κατηγορικός as *ḥamlī*, where it means "affirmative": *An. Post.* 85ᵃ14 (with the due gloss *ay mūjib* [i.e. affirmative]).—Exceptions within these trls.: *An. Post.* 96ᵇ13 κατηγορία—al-maqūla, *Phys.* 201ᵃ1 τὰ κατηγορήματα—al-maqūlāt, *Metaph.* 1029ᵃ21, 23 κατηγορεῖται—yuqāl, 22 τῶν κατηγοριῶν—min al-qaṭāghūriyās, 1030ᵃ20 τὰ κατηγορούμενα—al-maqūlāt (Usṭāth).

[51] E.g. Stephanus 25, 6: μερικὸν δὲ λέγω τὸ ἄτομον καὶ καθ' ἑνὸς φερόμενον; Simplicius 24, 23: εἴτε ὁμωνύμως κατὰ πλειόνων φέρεται τὸ αὐτὸ ὄνομα εἴτε συνωνύμως (as from Plato; 63,33: ἀναφέρομεν τὸ συμβεβηκὸς πρὸς τὸ ὑποκείμενον (Simplicii in Aristotelis Categorias Commentarium, ed. C. Kalbfleisch. Comm. in Ar. Gr. VIII, Berlin, 1907).—The term *maḥmūl* was taken literally by al-Kindī, who used the active participle *ḥāmil* as a correlative term instead of *mawḍūʿ*, thus creating a handsome pair of metaphors [what carries—what is carried] for the relation between substratum and accident as well as between subject and predicate (Book of Definitions [A. Rīda, I, 166], s.v. *al-jawhar: al-jawharu huwa 'l-qāʾimu bi-nafsihi wa-huwa ḥāmilun li-l-aʿrāḍ* [substance is what subsists by itself; it carries the accidents]. Survey of Aristotle's works [op. cit., 366]: *De Int.* is said to be concerned with the interpretation of *qaḍāyā ⟨min⟩ mawḍūʿin wa-maqūlin aʿnī min ḥāmilin wa-maḥmūlin* [statements made up of a subject and a predicate, i.e. of something carrying and something carried]). Al-Kindī's fashion of talking was without consequences in Arabic logic. In Hebrew, however, the terms for "subject" and "predicate" are *nōśē* and *nāśū* [what carries—what is carried] even in present times and might well go back to al-Kindī.

[52] In explaining the Greek terms, Probha (Hoffmann 81,23) uses *śāʾem—mərīm* [*ponens—tollens*], metaphors that do not account for the choice of words in Arabic.

[53] A strictly lit. trl. of κατηγορικός would be *maqūlī* (in Yaʿqūbī, 145, we find *maqūl* in the meaning of "categorical"), a trl. on the basis of the equation κατηγορέω: *ḥamala* would be *ḥamlī* (cp. n. 50), but this was the technical term for "categorical" as opposed to "hypothetical" (cp. *Comm.* 53,6).

[54] E.g. *Cat.* 2ᵃ5, 8, *De Int.* 17ᵃ8, 25, *An. Pr.* 32ᵃ22, *An. Post.* 72ᵃ14, *Top.* 109ᵇ17 (ad-Dimashqī), *Soph. El.* 176ᵇ19 (anon., ibn ʿAdī, ibn Zurʿa), *De An.* 431ᵃ16, *Metaph.* 1008ᵃ9 f., 34 f. (Usṭāth).

[55] *De An.* 431ᵃ9: καταφᾶσα ἢ ἀποφᾶσα—al-ithbat aw an-nafy.

[56] Stephanus 24,19: προσδιορισμὸς τοίνυν ἐστὶ πρόσρημα σημαῖνον ἐπὶ ποσὸν ὑπάρχει τὸ κατηγορούμενον τοῦ ὑποκειμένου.

[57] The translators of Aristotle did, of course, often try to differentiate between ὁρίζω

and its composites διορίζω and προσδιορίζω (non-technical in Aristotle). Usṭāth employs forms of *faṣṣala* [differentiate], *mayyaza* [do.] and *zāda* [add]; Isḥāq: *istathnā* [qualify], *lakhkhaṣa* [to outline] *(De Int.)*, *faṣṣala (De An.)*; ad-Dimashqī: *ḥaṣṣala, istathnā, lakhkhaṣa*, and *(Top.* 131ᵇ6, 8, 10, 14 f. for διορίζω and derivates) *ishtaraṭa* [to make a condition]. Incidentally, this is apparently the model for al-Farabi's very frequent use of *ishtaraṭa* in places where Aristotle would use διορίζω (see *Comm.*, index s.v.).

⁵⁸ 87,5 f.: *al-kalām ʿalā thalāthati awjuhin: maḥṣūrun ka-qawli 'l-qāʾili kullu insānin kātibun wa-muhmalun ka-qawlihi insānun kātibun wa-makhṣūṣun ka-qawlihi Fulānun kātibun* [sentences are of three kinds: quantified, e.g. "every man writes", indeterminate, e.g. "a man writes", and individual, e.g. "Fulan writes"].

⁵⁹ So Moses ibn Tibbon in his influential translation of Maimonides' *Maqāla fī ṣināʿat al-manṭiq*, an introduction into Arabic logical terminology based on al-Farabi's works. See M. Ventura (ed.); *Maimonide, Terminologie logique*, Paris, 1935, p. 32 (Hebr.), 134 (Ar.). In a Hebrew trl. of al-Farabi's *K. al-qiyās*, however, *sūr* has been translated literally as *hōmā* [town wall] (Ventura, p. 31 n. 1). Neither *sūr* nor *heqqēph* has been imitated in Latin trl. (cp. *Logica Sapientis Rabbi Simeonis* [wrong for *Mosis*] *per Sebastianum Munsterum Latine iuxta Hebraismum versa*, Basle, 1527: *heqqēph = signum*, and: *Aristotelis Opera cum Averrois Commentariis*, Venice, 1562, I, 1, p. 76A: ... *enuntiationem esse alicuius rei universalis vel singularis; et si rerum fuerit universalium necesse est ut sumatur cum aliquo signo indicante quantitatem (quod Arabes murum vocant) vel sine tali signo.*

⁶⁰ But cp. the parable attributed to Muḥammad by tradition, saying that the "straight path" is lined with a *sūr* on each side, and likening it to Islām, the two walls to *ḥudūd Allāh* [God's rulings] (see Wensinck *et al., Concordance et indices de la tradition musulmane*, III, Leiden, 1955, s.v. *sūr*). I am not suggesting that this report could have had something to do with the choice of the word for "quantifier", but it illustrates nicely that *sūr* was well within the field of associations of *ḥadd* [the normal equivalent of ὁρισμός in the trls.].

⁶¹ I am grateful to Mr. E. Kohlberg of St. John's College, Oxford, for this information and for valuable help with many other points of Arabic, and also Hebrew.

⁶² *ghayr mumkin/mā lā yumkin:* e.g. *Cat.* 8ᵃ30; *An. Pr.* 34ᵃ9, 32 f.; *An. Post.* 85ᵃ16, 19; *Top.* 157ᵇ35 (Ibrāhīm); *Soph. El.* 167ᵇ23 (ibn ʿAdī); *Metaph.* 999ᵇ11 (Usṭāth); *muḥāl: De Int.* 22ᵇ28; *An. Pr.* 34ᵃ3, ᵇ3; *An. Post.* 87ᵃ2, 6; *Soph. El.* 167ᵇ23 (ibn Zurʿa); *Phys.* 265ᵃ19.

⁶³ *De Int.* 21ᵃ37 *passim; Metaph.* 991ᵃ18 (Naẓīf).

⁶⁴ Probha 66,5; Paulus Persa 10,28. In the Syriac trls. published by Hoffmann, ἀπόφανσις and ἀποφαντικός are transliterated, though the forms of ἀποφαίνεσθαι are rendered through forms of *pəsaq*.

⁶⁵ See nn. 18, 64. Furthermore ibn al-Muqaffaʿ 163,2 (*durūb al-kalām al-arbaʿa allati hiya al-amr wa-s-suʾāl wa-l-masʾala wa-l-khabar*); Ikhwān aṣ-Ṣafāʾ 331. Al-Kindi's mention, in his *Survey*, of *al-mukhbir min al-qawl* [the informative type of sentence] indicates knowledge of the topic; a list of 10 (Stoic) is supplied in Yaʿqūbī's extra lines. Otherwise the Peripatetic list prevails.

⁶⁶ *Cat.* 8ᵇ22: ḥukm, do. *An. Post.* 72ᵃ11, 19; *Phys.* 204ᵃ32: qawl [saying]; *De An.* 403ᵇ22, 405ᵇ9: qawl qāṭiʿ, 405ᵃ9, ᵇ2: zaʿama [maintain], 409ᵇ20: athbata [affirm]; *Metaph.* 993ᵇ17: takallama [speak] (Isḥāq), qāla [say] (Usṭāth), 1073ᵃ16: qaḍāyā (for ἀποφάσεις = ἀποφάνσεις); *Rhet.* 1394ᵃ22: qaḍiyya.

⁶⁷ That *qaḍiyya* was already known to translators as a term meaning "statement" appears from places where it is employed in this meaning, for reasons of expedience, without having a counterpart in the Greek, e.g. *An. Pr.* 32ᵃ22: αἱ ἀποφάσεις καὶ αἱ καταφάσεις—al-qaḍāyā 'l-mūjiba wa-s-sāliba (while ἀπόφανσις is left untranslated in 38ᵇ21); *An. Post.* 26ᵃ16: ἡ ἐν τῷ συλλογισμῷ—al-qaḍiyyatu 'llatī fī 'l-qiyās; *Top.* 156ᵃ5: τὸ καθόλου—al-qaḍiyyatu 'l-kulliyya (Ibrāhīm). Elsewhere, *ḥakama* and *qaḍā* with their derivates are used as chief renderings of κρίνω and its derivates, e.g. *Soph. El.* 180ᵇ24 (anon., ibn ʿAdī, ibn Zurʿa), *Phys.* 216ᵇ19, *De An.* 205ᵇ8, 424ᵃ6, *Rhet.* 1398ᵇ19 ff., 1414ᵃ14.

⁶⁸ Al-Farabi uses qaḍiyya whenever he speaks with his own voice rather than that of

Ishaq's trl. Cp. Comm., index s. vv. *jāzim, ḥakama, qaḍiyya*. In *K. al-ʿibāra, qaḍiyya* is used exclusively, except that *qawl jāzim* is used in relating the traditional distinction between stating and non-stating sentences (p. 45).

[69] A gloss on *ḥukm* at its first appearance in the translation of *De Int.* in the Paris MS (f. 179a) says that *ḥukm, qaḍāʾ, jazm* and *ḥatm* [decree] are all synonymous, thus indicating that a variety of expressions was in use. (We find *ḥatm* in the account of the Ikhwān (332), but as an epithet to *ḥukm* in opposition to *sharṭ* [condition], hence in the meaning of "categorical". If the reading *ḥatm* is correct and should not rather be *khabar*, the Paris note shows that the variety of earlier Arabic traditions using *khabar* as an alternative term was quite out of sight of the later Baghdad logicians.) In the notes on *De Int., qaḍiyya* occurs only once (f. 184b), *ḥukm* several times and *muqaddama* [premiss] in the majority of cases. This must be in imitation of the usage of later Greek authors among whom πρότασις was the chief term for "statement" (*propositio*, Boethius' translation of πρότασις developed in the same direction). *Qaḍiyya* was literally translated into Hebrew as *mishpaṭ*, a term still used in modern Hebrew. In German logic, the term *Urteil*, translating medieval Latin *iudicium*, was used until recently. Since *iudicium* does not occur in Roman logic as a synonym of *propositio* and *enuntiatio* (cp. Prantl, I, 520), it seems reasonable to expect that it was the Arabic term or its Hebrew equivalent that caused the Latin word to assume the special meaning of "statement". However, I have not yet come across an instance of *qaḍiyya* or *mishpaṭ* being rendered as *iudicium* (the Latin version of the logical treatise by Maimonides [see n. 118] says *iudicium* for *mishpaṭ* at its first occurrence, only to add *sive propositio* and never use the literal trl. again).

[70] Checking how ἀξίωμα has been translated in Aristotle's works, we find *qaḍiyya* in *Phys.* 252ᵃ24 and in *Top.* 159ᵃ4. In 156ᵃ23, the paraphrase *al-qaḍāyā al-wājib qabūluhā* [statements necessary to accept] occurs, which shows that Ibrāhīm felt *qaḍiyya* alone to be too weak a translation, being as it was a common term of logic for any kind of statement. *An. Pr.* 37ᵃ10: εἴ τις ἀξιώσειεν—*in qaḍā aḥadun bi-hādhihi 'l-qaḍiyya*. These instances certainly show that *qaḍiyya* was not inconceivable as a translation of ἀξίωμα.